Using high reliable Airport Traffic Sensor for aircraft and vehicle detection in runway/taxiway area

- for improvement of safety on airports,
- to improve the integrity of radar traffic surveillance
- for protection of safety critical areas (e.g. runway incursion)
Function

- detection based on the change of low frequency magnetic field generated by microcomputer based signal evaluation
- simple cable in taxiway or runway activated by remote enhanced microprocessor operation provides a high sensitivity and automatic calibration
- robust against interferences
- well proved technology
- more than 1,300 sensors installed on 16 airports worldwide
- provides extremely high availability and integrity

Sensor system consist of

- detection sensitive area (DSA) formed by outdoor copper cable
- standard communication cable for signal transmission
- well protected indoor electronic for signal evaluation

Cable length up to 2500m!

No electronics anywhere in the field!

Typical application: „Runway entry“ – STB/TXC control

1. Aircraft on presence sensor (A), taxiway lights on, stop bar on, exit taxiway lights off.
2. Taxiway lights off, stop bar off, exit taxiway lights on, aircraft passing overrun sensor (B).
3. Aircraft on exit taxiway sensor (C), stop bar on, exit taxiway lights between stop bar and exit taxiway sensor off, taxiway lights on.
4. Aircraft on runway, stop bar on, exit taxiway lights between stop bar and exit taxiway sensor off, exit taxiway lights on.
5. Aircraft on departure sensor (D), exit taxiway lights completely off, stop bar on, taxiway lights on.
Evaluation unit
- evaluation unit ISA-2DET for up to four individual sensors
- indication of engagement of areas
- indication of different errors like open circuit or short circuit
- service plug for configuration (RS232) during commissioning
- interface to control and monitoring system available as:
  - serial communication interface (single or redundant)
  - parallel output interface via opto coupling devices

Service – commissioning configuration interface
The service program for ISA-2DET is used to configure the different sensor arrangements as given by the requirements of the airport and for testing the correct function of the sensors.

A portable PC is connected via RS232 interface to the service plug at the front of the ISA-2DET for this purpose.

During commissioning mechanical and electrical parameters for the actual installed sensors have to be entered as well as the type of detection sensitive area (detector) used.

Folder for input of mechanical and electrical parameters for the actual installed sensors

Folder to define type of detector used

Arrangement of DSA
- Arrangement of detection sensitive areas to detect presence, incursion, lead-on and departure

One DSA for Taxiway up to 32 m

Two DSA for Taxiway/Runway up to 65 m

- Arrangement in a row for detection of classification, velocity and
The sensor system consists of:

1. In the field
   - sensor cable: Oelflex 400P, 4 x 1,5 (11 mm Ø)
   - sensor dimension 3 m x 5 m up to 4,5 m x 30 m
   - telephone cable (x times twin core 0,8 mm Ø) type: A-2YF(L)2Y
   - length up to 2500 m between sensor and evaluation unit ISA

2. Cabinet
   - 19” mounting rack incl. power supply and over voltage protection available for
     - five ISA-2DET with serial interface (single or redundant)
     - eight ISA-2DET with parallel interface

Technical Data
   - reaction time less than 300ms
   - error detection time less than 300ms
   - permanent self tests and automatic system calibration through mathematical procedures
   - aircraft/vehicle detection in four classes
   - 160 measurements per second for each sensor

Highlights
   - detection of presence, incursion, lead-on and departure
   - detection of classification, direction and velocity using special arrangement (“cvd-configuration”)
   - up to 2500 m distance between sensor and evaluation unit ISA
   - no electronics in the field
   - robust sensor cable and proved installation allow laying cable across gaps in pavement
   - redundant power supplies (optionally)
   - redundant communication to CMS (optionally)
   - proved installation of more than 1,300 sensors on 16 airports world-wide

Customer Training (on request)
   - Design Training (one day)
   - Maintenance Training (one day)